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Macroeconomic Adjustment and Growth

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Growth, External Debt, and the Real Exchange Rate in Mexico

Sweder van Wijnbergen

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A period of rapid growth and heavy external borrowing ended for Mexico with the debt crisis of mid-1982. This episode taught certain lessons, according to van Wijnbergen: Growth accompanied by unsustainable borrowing could produce later losses that more than offset earlier gains. Mexico's agenda should therefore be renewed growth within the limits of creditworthiness. Fiscal constraint is equally necessary, to keep inflation low and predictable.

As long as internal interest rates remain as high as they are, Mexico's fiscal problems are intractable without renewed access to foreign capital markets. But rollover of half or two-thirds of foreign interest payments, in addition to principal payments, would bring a solution within reach. However, service of the face value of the current debt — without substantial amounts of new money — is incompatible with renewed output growth and thus not really in anyone's interests.

Renewed access to foreign capital markets is imperative both for restoring medium-term growth and for success of the current short-term stabilization effort. But not all forms of access are equally beneficial.

What would be the macroeconomic effects of debt-equity swaps? Swapping public debt for private equity, says van Wijnbergen, would raise the equilibrium inflation rate substantially if they were implemented on a scale large enough to be interesting from a macroeconomic point of view. But without access to foreign capital markets in one form or another, output growth would be compromised.

The increase in external debt implied by renewed access to international capital markets does not really threaten Mexico's creditworthiness. Lending to Mexico would probably increase the expected net repayment, in terms of discounted value, rather than decrease it — increased upfront borrowing notwithstanding.

But much depends on developments in world commodity and capital markets. A 2 percent increase in world interest rates would slow down Mexico's growth an estimated 1 percent.

Therefore, external debt arrangements should include contingency clauses conditional on developments in oil prices and interest rates.

Van Wijnbergen concludes that with foreign financing in place, and Mexico's internal reform program continued and deepened, a cautiously optimistic prognosis seems justified. Growth is likely to begin recovering by the end of 1989, with positive per capita growth thereafter. Although this will require additional funding from abroad, Mexico's debt indicators should decline substantially. If Mexico continues its reform program, investing in Mexico should pay off handsomely.

This paper is a product of the Country Operations Division, Latin America and the Caribbean Country Department II. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Myriam Bailey, room I8-169, extension 31854 (30 pages with charts).

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by
Sweder van Wijnbergen

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I. Introduction

Mexico's growth rate averaged 6.6% between 1950 and 1974. Between 1982 and 1987, Mexico did not grow at all. This stark contrast sets the agenda for the next six years. Restoration of growth to rates that offer some hope of improvement in per capita income should be the predominant economic concern in the coming Sexenio.

Of course, Mexico has recently done even better than 6.6%. Between 1978 and 1982 the economy grew at no less than 8.7% per year on average. However, over the same period external debt tripled, from 29 to 86 billion US dollar. Thus the ratio of external debt to GDP jumped from 28 to 52 percent, the high growth rate notwithstanding. This period was brought to a crashing halt during the debt crisis of mid-1982. The 78-82 episode highlights the constraints under which the economy should operate even if they would not be externally imposed; growth accompanied by unsustainable debt accumulation could very well lead to later losses that more than offset the earlier gains. The agenda is therefore not just restoration of economic growth, but renewed growth within the limits set by creditworthiness.

Recent economic history has taught another lesson. The outburst of spending in the late seventies, and the subsequent decline in oil prices and increases in real interest rates payable on the external debt caused serious public finance problems. These public finance problems in turn triggered an increase in inflation not seen earlier in Mexico's economic history. International evidence clearly demonstrates that high inflation rates go together with high relative price variability even when underlying supply and demand factors show no such variability. To this, high inflation will add fears of future recessionary stabilization programs. It should thus be clear that high inflation effectively precludes efficient private sector investment at levels necessary for satisfactory output growth. Economic stability is therefore a precondition for efficient economic growth. The agenda is thus further restricted: to the external constraint are added the fiscal constraints dictated by the requirement of low and predictable inflation rates.

To sum up: can external restraint and internal balance be reconciled at levels of savings and investment that allow satisfactory output growth? What is the role of fiscal policy, interest rates and exchange rates in bringing such a configuration about? Should an attempt be made to borrow more? What does this imply for the future burden of the debt? To which extent do the answers to all these questions depend on external events such as oil price or interest rate shocks? In what follows we first (Section III) provide an analysis of the consistency of fiscal deficits with other macroeconomic targets. Issues of growth, external balance and real exchange rates are taken up in Section IV.

The remainder of the paper is organized as follows. In Section II, we set the stage by providing a brief historical overview of the developments leading up to the current situation. We then present a quantitative framework that allows us to go beyond qualitative discussions in exploring the policy options ahead. Section III assesses the limits on fiscal policy imposed by the macroeconomic targets embedded in the stabilization program. In Section IV we discuss whether within these constraints satisfactory output growth can be achieved without jeopardizing external balance. We discuss the role of

exchange rates and fiscal policy, and trace the impact of external developments on growth and external debt in Mexico. Section V concludes.

II. Stability, Expansion and Collapse: a Brief Review of the Past

Between 1950 and 1974, Mexico enjoyed a remarkable period of high growth, low inflation and moderate external debt accumulation. Real growth averaged 6.4%, and inflation was in single digits throughout the period. This era of fiscal conservatism came to an abrupt end in the early seventies. Rapidly expanding government involvement in the economy pushed up the rate of economic growth. However, increasing government expenditure was not matched by rising public sector revenues. At the same time a decline in private savings incentives (real interest rates turned sharply downwards) prevented a matching increase in private savings. As a result, inflation tax and external debt became increasingly important sources of finance. The period of single digit inflation ended in 1973, the real exchange rate started to appreciate and external debt accelerated beyond the rate of growth in GDP from that year onwards.

Sharp adjustment measures in 1976 were not followed by a major crisis because major oil discoveries and subsequent oil price increases provided relief of both fiscal and external problems. In fact the subsequent period was characterized by both rapidly expanding government revenue and vastly increased public sector borrowing. On one measure (share in Value Added), the government sector increased by almost one third over this period. Government investment increased its share in total investment from 33.5% over the period 1970-75 to substantially over 40% in later years. Not surprisingly, the real exchange rate once again started to appreciate, eroding the gains of the 1976 devaluation. This expansion was largely fueled from abroad: Mexico's external debt increased from 16 bUS dollar to 86 bUS dollar between 1975 and 1982. A rapidly appreciating real exchange rate masks this increase when measured as a share of GDP however.

All this came to an end in 1982 when rising world interest rates and falling oil prices put an end to the increasingly expansionary policies of the Lopez-Portillo administration. The subsequent cut off from external capital markets left no option but fiscal retrenchment. Mexico, which had run non-interest current account deficits in each of the preceding thirty years, suddenly needed to run surpluses on that account in every following year. The ratio of external debt to GDP shot up anyhow under the influence of rising interest rates and falling growth rates. The gap between real interest rates on external debt and real GDP growth went from -6.3 percent in 1980-1981 to a full +10.5 percent in 1983. Differences this high mean that, even without deficits on the non-interest current account, the burden of debt will increase rapidly, simply through the compounding effect of interest on debt inherited from the past. In addition came substantial capital losses on external debt due to the necessary real exchange rate depreciation. The real depreciation was unavoidable given the major decline in oil revenues and rise in real interest obligations, but it added no less than 30 percentage points to the ratio of external debt to GDF during the period 1982-1987.

The counterpart to the non-interest current account improvement was a fiscal adjustment effort that is probably unmatched on a sustained basis in any country. A primary fiscal deficit of 7.1 percent of GDP before the crisis was turned into an astounding surplus of 5.3 percent in 1987 and an estimated

7.6% in 1988. And this while revenues from oil exports declined by more than 7 percent percent of GDP between 1983 and 1988, and GDP growth declined dramatically. Non-interest government expenditure was reduced from the equivalent of 34% of GDP in 1982 to about 25% in 1987. The public enterprise divestiture program was successful in closing or selling roughly 600 smaller entities, out of a total of about 1200 at the beginning of the period, with negotiations initiated or scheduled to start on a few larger enterprises. In addition to all this, Mexico has undertaken structural reforms at an accelerating pace over this period.

1983 saw an IMF supported stabilization effort, during which the fiscal deficit was halved, international reserves recovered, and inflation came down. However in 1984 and 1985 there was some fiscal expansion and monetary relaxation. On top of that came the earthquake late 1985 and a major terms of trade deterioration in 1986 due to falling oil prices. In response, the authorities adopted a new stabilization program in July 1986. In return for renewed monetary and fiscal austerity, this program also called for a concerted financing effort on the part of Mexico's creditors.

The 1986 package included new elements of policy reforms designed to eliminate structural rigidities in the economy. The most significant change is a major reorientation towards exploiting the benefits of international trade. Exports of manufactures, spurred by a 42% real depreciation over the July 1985-December 1987 period, have overtaken oil exports and more than compensated for the 7 billion U.S. dollars oil revenue loss experienced over the same time span. The trade liberalization process gained momentum since 1985. QRs were more than halved, tariffs reduced sharply, and quantitative controls on non-oil exports almost eliminated.

The fiscal retrenchment was clearly unavoidable given the sudden lack of access to international capital markets and the series of adverse terms of trade shocks that took place over the period. As a byproduct, the severe fiscal cutbacks have greatly increased the efficiency of many of the remaining government operations. But cutting the public sector investment budget from almost 10% of GDP in 1982 down to an estimated 3.0% of GDP in 1989 clearly has its costs; government investment has a role to play in areas that heavily complement private investment and in the social sectors. Also, private investment has not made up for the decrease. In fact it is surprising that the volatile macroeconomic situation has not led to a larger decline in private investment. It now is more or less at its pre-oil-boom level of 11 to 12 percent of GDP.

With lower investment on the one hand, and restrictive demand management on the other, real growth again stopped. There has been no real growth between 1982 and 1988, and hence a severe decline in per capita income. Also, inflation, rather than slowing down, in fact accelerated towards the end of the period, partially in response to a sharp nominal devaluation. This devaluation had become necessary because of the abrupt oil price decline in 1986. The subsequent de-facto targeting of the real exchange rate, together with an increase in the frequency of wage and cost adjustments, introduced an element of inherent instability into the system. This latter became fully apparent towards the end of 1987. The stock market plunge and a temporary opportunity for private debt buy backs evolving from the 1987 debt rescheduling triggered a run on the peso. This resulted in reserve losses and eventually a 37% depreciation, fueling inflation and expectations of further exchange rate depreciations. Mexico responded with the Pacto de Solidaridad, a

concerted effort to bring down inflation that was now running well into triple digits.

The Pacto (and its successor, the PECE) have to date clearly been successful. Inflation, after accelerating well into triple digit levels in 1987, has been around one percent a month most of the second half of 1988. A brief increase in December and January seems over as the March rate is once again in the one percent range. Nevertheless sustainability fears seem not yet allayed: domestic interest rates are still over 50% once compounded, and in real terms slightly over 30% if the inflation target of 20% is going to be met. Much of that is clearly related to worries about the public finance and exchange rate impact of the external debt situation.

III. Consistency of Fiscal Policy.

A fiscal stance that does not conflict with sustained low inflation, even in the event of unfavorable external developments and continued high real interest rates, is clearly necessary, although possibly not sufficient, to allay inflationary fears. Only if the inflation compatible with public finance requirements is compatible with the inflation rate implied by the fixed exchange rate regime, is the latter going to be sustainable. And this in turn is the cornerstone of the Pacto. Thus medium term consistency requirements, when violated, give a signal that will greatly complicate short term macromanagement. This will require restrictions on both the overall deficit and its mode of financing.

There are three sources of financing public sector expenditure beyond what can be obtained from the regular tax system: external borrowing, monetization and issue of domestic interest-bearing debt. The amount that can be expected from each source will depend on other macroeconomic targets, such as inflation, output growth, interest rates and so on. The revenue from these three sources of financing can be combined into the calculation of a "financeable deficit". This is defined as the deficit that does not require more financing than is compatible with sustainable external borrowing, existing targets for inflation and output growth, and a sustainable internal debt policy. If the actual deficit equals this "financeable" deficit, fiscal policy is consistent with the macroeconomic assumptions and targets underlying the calculation of the financeable deficit. [1/]

Underlying the framework suggested here to calculate the financeable deficit is a model describing private portfolio choice as a function of inflation, output and interest rates. This gives the amount of currency, demand deposits and time deposits the private sector is willing to hold given output, inflation and the level and structure of interest rates. This is coupled with a simple financial sector model incorporating reserve requirements and other bank regulatory policies to derive the demand for reserves by commercial banks. The demand for reserves is then added to the

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[1] This should be interpreted with care. Consistency with macroeconomic targets does not guarantee that those macroeconomic targets can or will be achieved; only that the fiscal deficit is not inconsistent with them. To actually achieve the stated macroeconomic targets may require other measures, possibly including fiscal retrenchment beyond what is required for consistency as defined here.

demand for currency already derived to get an estimate of the total demand for base money given inflation, interest rates, and so on. All this is used to derive total revenue from monetization, net of interest payments on reserves, for different output growth rates, interest and inflation rates and regulatory policies. To revenue from monetization must be added the revenue the government can expect from external and internal debt issue given its external borrowing policies and debt management approach. One can then calculate the financeable deficit [2/].

The difference between the actual deficit in 1988 and this financeable deficit is called the required deficit reduction, RDR. A deficit cut equal to RDR will restore consistency with other macroeconomic targets. The results of such an exercise for Mexico are summarized in Table 1. The table lists the results for various assumptions on other macroeconomic variables.

In the calculations underlying the Table, it is assumed that issue of interest-bearing domestic debt is kept down to a rate that will maintain the real value of the domestic debt constant. The reason for not allowing a faster rate of domestic debt issue is the high interest rate it currently carries; at around 30% per year (almost 40% by year end!), it is well above the real growth rate of the economy. At this rate, debt-service will escalate as a percentage of GDP if more extensive use is made of debt-issue to finance the deficit. As to foreign financing, different options are explored. The first row of the table assumes that the nominal value of the foreign debt stays constant (CAD=0). The second row looks at the consequences of changing that option to either a constant real value of the debt or to assuming a constant debt-output ratio.

With zero net foreign debt increase, the 1988 operational deficit (4.4 percent of GDP) is seriously out of line with inflation targets, as the first row demonstrates. The actual deficit in 1988 needs to be cut by 4.4 percent of GDP for compatibility with an inflation target of 15 percent, or the entire operational deficit needs to disappear. This reflects the fact that Mexico receives very little from the inflation tax and seigniorage, because of low growth and the practice of paying interest on reserves. Even for a 50% inflation target, the RDR still amounts to a hefty 3.3 percent of GDP.

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[2] A simple version of this framework was first used in Anand and van Wijnbergen (1989). The current version incorporates external debt considerations and implications of the financial structure for inflation tax revenues (van Wijnbergen and Anand (1988)).

TABLE 1: REQUIRED DEFICIT REDUCTION (RDR) FOR CONSISTENCY WITH VARIOUS MACROECONOMIC TARGETS (AS PERCENT OF GDP).

1. NO REAL EXCH.DEPRECIATION; CAD=0; OUTPUT GROWTH 1.5%					
INFLATION TARGETS	p:	0	5	15	50
	RDR:	5.1	4.8	4.4	3.3
2. NO REAL EXCH. DEPRECIATION; INFLATION 15%; OUTPUT GROWTH 1.5%					
FOR.BORROWING	CAD:	0	3.1 1/	4.0 2/	
	RDR:	4.4	1.3	0.4	
3. NO REAL EXCH. DEPRECIATION; INFLATION 15%; CONST.B*/Y RATIO					
OUTPUT GROWTH TARGETS	n:	0	1.5	4	5
	RDR:	1.5	0.4	-1.3	-1.9
3. INFLATION 15%; OUTPUT GROWTH 1.5%; CONST. B*/Y RATIO					
REAL EXCH.RATE DEPRECIATION	c:	0	5	10	
	RDR:	0.4	3.0	5.7	

Notes: 1/ Constant real debt case
2/ Constant debt/GDP case

c :Rate of depreciation of the Real Exchange Rate
CAD :Current Account Deficit
n :Growth rate of real GDP
p :Inflation Rates
RDR :Required cut in fiscal deficit compared with 1988 (operational) deficit
B*,B :Foreign, Domestic Debt
Y :GDP

Of course more liberal access to foreign financing changes all that. The second row shows that the current deficit in fact is compatible with an inflation target of 15 percent if enough foreign financing is available to at least maintain the debt/output ratio constant. A less liberal target would keep the real value of the debt constant, which implies a 3 percent current account deficit, or refinancing of about half of interest payments, with correspondingly higher need to cut back on the fiscal deficit.

The third row of the Table shows how, under a constant debt-output ratio target for foreign borrowing, fiscal leeway increases with output growth. The

RDR falls from 1.5 percent of GDP at a zero growth rate to minus 1.3 RDR at a four percent real growth rate for GDP.

Fiscal Implications of Debt Management

With real interest rate differentials as large as they are now, debt management takes on a great fiscal importance. Take for example a debt/equity-swap scheme where say 10bUS$ is retired but a corresponding amount of domestic debt is issued by the public sector to acquire the private equity used in the swap. With a staggering 25 percentage points real interest rate differential, this operation would INCREASE the real interest rate burden by no less than 1.5 percent of GDP, raising the required deficit reduction for a given inflation target correspondingly. The impact on the operational deficit would be smaller, but still 1.2 percent. The smaller effect is because the operational deficit, somewhat inconsistently, counts payment of nominal interest rate charges on foreign debt, rather than just real foreign interest payments, like it does in the case of domestic debt. The whole operation would have a major impact on equilibrium inflation: even as small a debt/equity swap as the $10 bUS considered here would, at current interest rate differentials, raise equilibrium inflation by no less than 50 percentage points (See van Wijnbergen et al. (1988) for the methods used to arrive at this claim). The numbers are so large because in Mexico the base for the inflation tax is very low; commercial bank reserves basically carry market rates, so the inflation tax base is just currency in hands of the public, an almost negligible amount.

This points at the general issue of domestic debt. At 1.5% real growth and no net increase in foreign nominal debt, the fiscal gap is 3.1 percent of GDP for 15 percent inflation. What if this gap is filled by issuing internal debt rather than foreign debt? Since interest rates on internal debt exceed the real growth rate by such a margin, this funding policy would solve today's fiscal problem at the cost of a substantially more serious one in the following year. This strategy would raise the required deficit reduction for a 15% inflation rate from 4.4 percent to 5.3 percent of GDP within one year. If continued for six years, the debt-output ratio would have risen from 19 percent to 52 percent of GDP! This clearly highlights the fact that internal debt issue should be avoided at almost any cost in the current situation in Mexico.

The final exercise demonstrates the extent to which high real interest rates are at the root of Mexico's current fiscal problems. Table 2 shows the equilibrium inflation rate, i.e. the inflation rate for which no fiscal adjustment is required, for various real interest rates on Mexico's internal debt. All this on the assumption that no net increase in the nominal value of the foreign debt is allowed (i.e a zero external current account deficit for the public sector).

Table 2: EQUILIBRIUM INFLATION AND THE REAL INTEREST RATE ON INTERNAL DEBT

NO REAL EXCH.DEPRECIATION; CAD=0; OUTPUT GROWTH 1.5%			
REAL INT.RATE ON DOM.DEBT R	30	15	10
EQUILIBRIUM INFLATION p	150	22	0

At the current interest rate, the required deficit reduction is 4.4 percent of GDP; alternatively, an inflation rate of 150 percent is needed to cover this amount through inflation tax. At a more reasonable 15 real interest rate, the equilibrium inflation rate, for which no fiscal adjustment is required, falls to 22 percent! At a real interest rate of ten perce- the equilibrium inflation rate falls to zero. Note that as inflation r , additional revenue from inflation tax falls, necessitating increasingly larger increases in inflation to cover a given increase in the operational deficit. This is because at higher inflation rates the elasticity of money demand increases, thus lowering the additional marginal revenue that a given increase in inflation rat yields as inflation rises.

IV. Macroeconomic Stability, External Balance and Growth: Can They Be Reconciled?

IV.1 A Quantitative Framework

A Purpose and structure of the Model

The model presented here is designed to shed light on the key questions raised in this report: can the objectives of external balance and satisfactory output growth be reconciled? What is the role of fiscal policy in this trade off? Which real exchange rate path is compatible with the various policy scenarios and growth requirements? What is the relation between exchange rates and external balance? The model is used in an empirical investigation of the trade off between output growth and external balance, and the role relative prices have to play in this trade off.

Real interest rates play an important role in the model. High real interest rates, by depressing private investment and consumption, create more room for fiscal deficits for any given external balance target. At the same time, high real interest rates complicate fiscal management, since they raise the cost of servicing the domestic part of the public debt. Crucial parameters are the sensitivity of private savings and investment with respect to the real interest rate; these receive detail attention in the empirical section below.

A second channel between fiscal policy, output growth and external debt depends not so much on the interrelation between aggregate fiscal deficits, real interest rates and the current account, but more on the composition of the public sector expenditure program. A substantial part of aggregate investment in Mexico has traditionally been undertaken by the public sector. As a consequence, the government's allocation of its total expenditure over consumption and investment is an important determinant of output growth for any given aggregate expenditure level and time path of the real interest rate.

Another important relative price that is endogenized in the model is the real exchange rate. The real exchange rate plays a role in the allocation of expenditure over different goods at a given moment of time, similar to the way the real interest rate influences the intertemporal expenditure of expenditure for given intra-temporal allocation (cf van Wijnbergen (1989) for a detailed exposition of the theory underlying this model). This is a rather different approach from most other empirical models, where the real exchange rate, if it is endogenized at all, is often derived from current account considerations. In our setup, the real exchange rate also influences the current account, but in a rather complicated manner, through its impact on aggregate supply and investment behavior. No empirical evidence could be found to support the Laursen-Metzler notion that the real exchange rate also influences consumption expenditure.

It is in fact more natural to think of the real exchange rate as the relative price clearing the market for "Mexican" goods. Its equilibrium value is thus not derived from current account considerations, but from commodity market clearing conditions. The level of external transfers, the composition of government expenditure over home and foreign goods, and commercial policy all have an important impact on the real exchange rate in this approach. Explicit nominal exchange rate policies targeting the real exchange rate may, if successful, cause persistent commodity market disequilibrium (van Wijnbergen (1989)).

In the following pages, we provide a simplified exposition of the analytical structure of the model. We then discuss the empirical application to Mexican data.

A.1 Real Interest Rates, Fiscal Policy and Output Growth.

As long as domestic interest rates are not completely linked to foreign interest rates (plus exchange rate depreciation) there is an additional degree of freedom in macroeconomic policy. Then changes in domestic real interest rates can resolve potential discrepancies between fiscal deficits and external targets through their impact on the net private savings surplus (i.e private saving minus private investment). In the process, private investment and hence output growth will be affected. This is one of the more important links between fiscal policy and output growth embedded in the model.The mechanism is shown in Figure 1. Underlying this figure is the following identity derived from the national accounts, but with behavioral content built into private savings and investment:

$$\begin{aligned} CAS &= FS + NPS(r) \\ &= FS + PS(r) - PI(r) \end{aligned}$$

The private sector's surplus of savings over investment, NPS=PS-PI, is shown as a function of the real rate of interest. A higher real interest rate will slow down private sector investment and increase private savings, thus increasing NPS. Empirical evidence on these effects is presented in Section 4.3. This is represented by the upward sloping line "NPS" in Figure 4.1.

The sum of NPS and the fiscal surplus (FS; this equals minus the deficit) equals the external deficit that is compatible with given real interest rates and with FS. The external deficit is represented by the line CA in Fig. 4.1. The horizontal line TCA is the target value for the current

account. The real interest rate at which the current account target TCA equals the current account CA is the real rate at which fiscal policy and current account targets are in line.

An increase in the fiscal deficit represents a decline in the fiscal surplus and hence a downward shift in the feasible current account line FCA. To still meet the same current account target, a higher interest rate is needed to call forth the required extra surplus of private savings over private investment (r shifts from rA to rB). A cut in fiscal deficits will thus allow lower real interest rates for given current account targets, and hence higher private investment.

Fig. 4.1

The analysis so far is not enough to tie the link between fiscal deficits and output growth. It has focused on the impact of the fiscal deficit on private investment; output growth depends on total investment, however, not just on private investment. Clearly, the impact of changes in fiscal deficits on output growth depends on whether the underlying adjustment is made out of public investment or out of public consumption. The model therefore breaks down public expenditure in public consumption and investment. Output growth depends on the sum of public and private investment.

Of course, interest rate arbitrage between domestic and foreign rates may eliminate any leeway for the domestic real interest rate to reconcile fiscal deficits with current account targets. In that case, another degree of freedom is lost. For any given rate of real depreciation, the link between fiscal deficits and the current account is direct if real interest rates at home and abroad cannot diverge more than the expected real rate of depreciation. The remarkably close link between the fiscal deficit and the current account in Mexico (cf Figure 4.3) suggest that interest arbitrage is in fact taking place in Mexico; the no-arbitrage version of the model, with real rates reconciling fiscal deficits and external balance , thus seems too extreme. We hence have used the model for given real interest rates, rather than fixing the fiscal deficit and having the real interest rate adjust endogenously. Of course the real exchange rate is not fixed in the real world, nor is its rate of change exogenously given. Policy measures will have a direct or indirect impact on both level and rate of change of the real exchange rate. To this we turn now.

A.2 Commodity Market Clearing and the Real Exchange Rate.

The presentation has until now focused on the current account, fiscal deficits, and the real rate of interest. But what about the real exchange rate? Popular discussions of the current account invariably involve the latter variable. This stems from the days where the current account was analyzed using partial equilibrium trade flow equations, with little attention for the underlying macroeconomic and intertemporal aspects. Within modern theory, and within our approach, the real exchange rate of course does have an impact on the current account, but in a much more ambiguous and indirect manner than in the standard open economy models inherited from the fifties and sixties.The approach adhered to here starts from the simple observation that the real exchange rate can be viewed as the relative price of Mexican (non-oil) goods (we will omit the "non-oil" qualification in the remainder of this section) in

terms of foreign goods. The "market" which the real exchange rate clears (possibly only after periods of disequilibrium), is the market for Mexican goods. The real exchange rate is thus a static relative price in that it measures the rate at which two different (aggregate) commodities can be exchanged at a given moment of time. The real interest rate measures the rate at which commodities can be exchanged at different moments of time, through savings or investment processes; it thus is an intertemporal relative price.

FIG 4.3 HERE

Consider the determinants of aggregate demand and supply in that market. Fig. 4.4 provides a diagrammatical elaboration (see Edwards and van Wijnbergen (1988) for a similar approach in a static framework). First aggregate demand for Mexican goods. One component comes from Mexican consumers (and investors). At a more appreciated real exchange rate ($de < 0$), Mexicans will tend to allocate their aggregate expenditure towards foreign goods rather than towards Mexican goods. Similarly, an appreciated real exchange rate will, ceteris paribus, cause lower export sales (foreign demand falls off). This is represented by the upward sloping curve A_d in figure 4.4.

Aggregate supply of Mexican goods is likely to increase when the real exchange rate appreciates (again, $de < 0$), if only because then intermediate imports will become cheaper in terms of mexican goods (see the econometric evidence presented below). The aggregate supply curve A_s therefore slopes down in Fig. 4.4 (note that e is defined as foreign over domestic prices, or the inverse of the relative price of home goods). The "equilibrium" exchange rate is the rate at which aggregate supply and demand for Mexican goods are in equilibrium: the intersection of A_s and A_d in fig.4.4. Above that intersection, there is excess demand for home goods and output will be supply determined: the exchange rate is undervalued (excessively depreciated). Below the intersection, supply exceeds demand and output is hence demand determined. The real exchange rate is overvalued and there is Keynesian unemployment.

An increase in government expenditure on home goods would shift the A_d curve down and so reduce excess supply and Keynesian unemployment problems (dotted line in fig. 4.4). As a consequence, the commodity market clearing, "equilibrium" real exchange rate would fall ($de > 0$ from E to F in Fig. 4.4).

FIG 4.4 HERE

A.3 The Real Exchange Rate, Interest Rates and the Current Account.

What about the current account? First note that the real exchange rate that equilibrates aggregate demand for Mexican goods with their aggregate supply, can do so at any level of the external deficit. An external deficit indicates that aggregate expenditure, by Mexicans but on foreign and domestic goods, exceeds aggregate income. It provides no indication however, that aggregate demand, by Mexicans and by foreigners, but now on Mexican goods alone, is in excess of aggregate suply of Mexican goods at the going real exchange rate.

That does not mean that the real exchange rate and the current account are entirely unrelated. Figure 4.5 draws on the preceding ones and demonstrates how the current account, the real interest rate and the real exchange rate interact. Consider first commodity market equilibrium, but now

not in "e-A" space, but with the real exchange rate and interest rate on the axes. Assume that at E commodity market equilibrium obtains. If one then moves to the left (the exchange rate appreciates, de<0), excess supply develops. This was also demonstrated in fig. 4.4. To restore equilibrium, demand need to be curtailed; one way of doing that is raising real interest rates; that lowers demand for all consumption and investment goods (see the empirical evidence presented below), thus also for domestic goods. The commodity market equilibrium locus thus slopes upward in r-e space.

Fig. 4.5 HERE

Consider next the combinations of r and e that will allow achievement of a particular current account target, say CAS^*, for given fiscal policy. If at E that target is achieved, moving up (higher r) will lead to overachievement: higher real interest rates will, ceteris paribus, reduce private consumption and investment and thus lead to a CA improvement. Which way will the exchange rate have to move to bring the CA in line with its target? As theory suggests, and the empirical analysis presented below confirms, the answer is sometimes unclear. Theory suggests that for constant rate of time preference the exchange rate has no effect on the private consumption (Razin and Svensson (1983)). The empirical analysis presented below shows that this is in fact the case for Mexico. On the other hand, investment will be affected negatively, mostly because of the impact on intermediate import prices of a devaluation, but this effect takes place with a one year lag only. In the short run the only effect at play is the negative impact of a real depreciation on aggregate supply. Thus in the short run a real devaluation is in fact likely to deteriorate the current account. However, in the longer run the negative impact on investment will reverse this, like in the standard J-curve effect, although through a different mechanism. This means that to restore the CA to its target in the short run a depreciation is needed (the CA curve slopes also upward, like the GM curve; see fig. 4.5.B), but in the longer run an appreciation will be necessary, leading to a negative slope (fig.4.5A). Since this analysis has a medium run focus, we still concentrate on the case where the slope is negative.

What does this analysis suggest will happen if, say because of "inertial" inflation and a fixed nominal exchange rate, the real exchange becomes overvalued? This is represented by the move from E to D in Fig. 4.5.A. First of all, there will be excess supply of domestic goods and hence falling exports, declining capacity utilization, and Keynesian unemployment. What happens to the current account depends on whether the CA curve slopes up or down; if down, it deteriorates when moving from E to D and if up it actually improves. If the two effects wash out, nothing will happen to it. In the medium run however, a deterioration is more likely according to the empirical analysis presented below. If the government responds to the rising unemployment and falling capacity utilization by raising government purchases of domestic goods rather than devaluing, the GM curve shifts to the left and the commodity market problem is resolved. However, especially if this fiscal expansion is not matched by increased revenues, the CA will deteriorate and the CA curve shifts up. This means that the original CA target will increasingly get out of reach. Thus an overvalued exchange rate will lead to unemployment and possibly to a deteriorating CA as time goes by, or to no unemployment but a real CA problem if fiscal policy is used to offset the

employment effects of the overvalued exchange rate. In this case the appropriate policy response to falling exports and sluggish capacity utilization is in fact a real depreciation, to which a nominal depreciation may contribute.

Of course, like in the preceding subsection, interest rate arbitrage takes away one degree of freedom: the real interest rate, for given RATE of depreciation, confines the economy to the line at $r^*+\hat{}e$). It will also pin down the growth rate, for given any public investment program; this can be seen in the left quadrant of diagram 4.5.

B Empirical Results

B.1 Aggregate Supply and Aggregate Demand

Consider first aggregate expenditure. Government expenditure, both on consumption and on capital goods, is considered a policy instrument. Consumption expenditure depends on estimates of permanent and temporary income, and on the after tax real rate of interest. The measure of permanent income is based on a simple trend regression of real disposable income on time, with a trend break from 1984 onwards (i.e. the decline in 1983 is interpreted as a surprise). The results of this regression are:

$$(1) \quad \log(y_{DR,t}) = \underset{(64.9)}{2.19} + \underset{(21.3)}{(0.063} - \underset{(7.21)}{D83PLUS*0.017)}*t$$

R^2=0.96 DW=1.58 1965-1987

Inflationary expectations are derived from a four year weighted average of actual CPI inflation rates. The predicted value of this weighting procedure is used in the calculation of real after tax interest rates. The nominal rate used is the nominal after tax time deposit rate series presented in Gil-Diaz (1988) for 1965-1986, and the three month after tax time deposit rate for 1987. With these definitions of temporary and permanent income and of the real interest rate, the econometric results for private consumption are:

$$(2) \quad \log(C_{pr,t}) = \underset{(25.6)}{5.18} - \underset{(1.83)}{0.44}\ \log(1+rr_{TD,t}) + \underset{(4.41)}{0.70}*\log(Y_{DR,T})$$

$$+ \underset{(12.2)}{0.86}*\log(Y_{DR,T}))$$

R^2=0.97, DW=1.14, 1970-1987

The results are promising; a coefficient with respect to permanent income that is highly significant, but not significantly different from one; a coefficient on temporary income that is significantly lower than the coefficient on permanent income; and, finally, a significant (at the 10 percent level) and negative coefficient on the real after tax deposit rate. However, the low value of the DW coefficient indicates some remaining specification error. The regression results deteriorated significantly when the real exchange rate was included; that variable never received significant

coefficients and was thus omitted. This finding has important consequences for the assessment of the impact of a real devaluation on the current account.

The second interest sensitive component of aggregate expenditure is private investment (fixed capital formation). Private investment depends on real interest rates, the relative price of intermediate inputs and the output capital ratio as a proxy of capacity utiliation, for which no data are available before 1980. The real interest rate used is based on the pre-tax nominal interest rate reported in Gil-Diaz (1988); this rate is converted into a real rate using a VAR of GNP deflator inflation on its own past values going back three years, plus a constant term. The predicted values of this equation are used as proxy for inflationary expectations; this proxy, in turn, is used to derive the real interest rate, rr_{GNP}. The measure of intermediate imports prices is the dollar-based unit-value of intermediate imports deflated by the dollar-based Mexican GNP deflator. This yields the following results:

$$\begin{aligned}(3)\quad \log(I_{pr,t}) = {} & 0.75 - \underset{(2.64)}{0.60}*\log(1+rr_{GNP}(-1)) - \underset{(1.05)}{0.26}*\log(1+rrr_{GNP}(-2)) \\ & \underset{(0.80)}{} \\ & + \underset{(7.18)}{1.59}*\log(y_t/K_t) - \underset{(2.12)}{0.30}*\log(P_{Mint(-1)})*E(-1)/P_{GNP}(-1))\end{aligned}$$

R^2=0.95, DW=1.23, 1970-1987

The results show a strong negative dependence of private fixed capital formation on real interest rates and on the relative price of intermediate imports in terms of final goods. Both enter with a lag, as should be expected; I_{pr} is actual investment expenditure, not orders.

Private investment and consumption expenditure plus total government expenditure and inventory accumulation (considered exogenous in the current version of the model) make up aggregate expenditure.

Aggregate supply of non-oil Mexican goods depends on the beginning of period capital stock, on the relative price of intermediate imports and on the relative final price of Mexican goods in terms of an index of foreign competitors prices abroad. The latter is measured as an aggregate of the dollar-based WPI in Mexico's main trading partners, with 1980 export weights.

$$\begin{aligned}(4)\quad \log(y_t/K_t) = {} & - \underset{(2.15)}{2.02} + \underset{(5.51)}{0.39}*\log(P_{GNP}/P_f) + \underset{(2.95)}{0.18}*\log(P_{GNP}(-1)/P_{f(-1)}) \\ & - \underset{(1.64)}{0.13}*PDL(\log(P_{Mint}(-1)/P_{GNP}(-1))\end{aligned}$$

R^2=0.96, DW=1.38, 1974-1987

The equation shows a strong positive response to the (inverse of the) real exchange rate: a real appreciation increases aggregate supply. Also, an increase in the relative price of intermediate imports or a decrease in the capital stock both lower aggregate supply.

Aggregate employment, N_t, depends on the real product wage and on aggregate non-oil output:

$$(5)\quad \log(N_t)-\log(N_{t-1}) = 0.006 - 0.13*(\log(W/P_{GNP})-\log(W(-1)/P_{GNP}(-1))$$

$$(1.11) \quad (1.87)$$

$$+ 0.54*(\log(y_t)-\log(y_{t-1}))$$
$$(5.22)$$

R^2=0.67, DW=1.74, 1966-1987

A small negative real wage elasticity, significant at a ten percent level, and an income elasticity substantially below one.

Next year's capital stock depends on this year's and on total fixed capital formation:

$$(6) \quad K_{t+1} = (1-0.04)*K_t + (I_{pr,t}+I_{G,t})$$

The assumption of a four percent depreciation rate is based on SPP data with some correction for the likely understatement of true depreciation in the national accounts in inflationary periods due to historical cost accounting practices.

The intertemporal part of the model is rounded out by the current account identity:

$$(7) \quad CA = y_t + X_{oil}*P_{oil,\$}*E/P_{GNP} - i^*B_{f,SE/PGNP} - C_{pr,t} - I_{pr,t} - G_t$$

B.2 Allocation of Expenditure and the Real Exchange Rate

The part of the model presented in the previous section focused mostly on intertemporal trade. It thus dealt with the allocation of current production and expenditure over the present and future periods, rather than over domestic and foreign goods. In line with that focus, the most important relative price variable was the real interest rate. In this section, the focus is intratemporal trade, allocation of expenditure over current Mexican versus current future goods, and the relevant relative price variable is the real exchange rate.

Consider first the allocation of domestic expenditure over foreign and domestic goods. We do this by explicitly estimating import demand equations for the different import categories. The volume of capital goods imported, Mcap, depends on the relative price of capital goods imports versus investment goods in general (the GNP deflator for investment) and on aggregate investment:

$$(7) \quad \log(Mcap) =$$
$$14.11 - 1.12*\log(P_{mcap,\$}E/P_{INV}) - 0.74*\log(P_{mcap,\$}(-1)E(-1)/P_{INV}(-1))$$
$$(5.93) \quad (5.63) \qquad\qquad (2.72)$$

$$+ 0.71*\log(I_{pr}+I_g) - 0.88*MQUSH(-1)$$
$$(5.77) \qquad\qquad (4.52)$$

R^2=0.94, DW=1.40, 1970-1987

The variable MQUSH is the fraction of imports covered by QRs; it is included in an admittedly crude attempt to capture to many changes in trade regime that have taken place in Mexico over the sample period. The results

show relatively high elasticities, all estimated with great precision (high t-statistics). The trade regime variable seems to pick up the degree of repressiveness of the trade regime: it enters with a strong negative sign.

Consider next consumption goods imports, Mcon:

(8) $\log(Mcon) =$

$$2.34 \underset{(0.94)}{- 2.12*\log(P_{mcon,\$}E/P_{CPI})} \underset{(4.85)}{- 1.23*\log(P_{mcon,\$}(-1)E(-1)/P_{CPI}(-1))} \underset{(2.7)}{}$$

$$\underset{(4.15)}{+ 1.31*\log(C_{pr})} \underset{(2.54)}{- 0.96*MQUSH(-1)}$$

R^2=0.82, DW=1.54, 1970-1987

Once again high and significant price elasticities and a strong negative impact of the proxy for trade intervention. Finally demand for intermediate imports, Mint:

(9) $\log(Mint) =$

$$\underset{(2.20)}{- 18.7} \underset{(5.29)}{- 0.64*\log(P_{mint,\$}E/P_{GNP})} + \underset{(10.2)}{2.84*\log(y)}$$

$$\underset{(1.34)}{- 0.96*MQUSH(-1)}$$

R^2=0.91, DW=1.40, 1970-1987

This equation shows a somewhat lower, although highly significant price elasticity, and an unusually high income elasticity.

One can deduce total demand for Mexican goods by domestic residents in any given period by combining the import demand equations with the equations for aggregate domestic expenditure, and scaling by the relevant relative prices. To complete the analysis of commodity market equilibrium in the market for (non-oil) Mexican goods, an additional element is needed, however: foreign demand for Mexican goods or export demand.

In the specification of the export demand equation, we assumed that Mexican exporters compete not so much with domestic producers in Mexico's export markets, but with other exporters to the same markets. This is a reasonable assumption, given that Mexico's two main export markets are the US and the EEC. Empirical analysis for other developing countries tends to confirm this view (cf Kharas (1988), van Wijnbergen and Arslan (1989)). This means that the relevant activity variable is aggregate imports into Mexico's export markets (weighted by their share in Mexico's total exports), and the relevant relative price variable is the ratio of Mexico's export price over the aggregate price index of imports into Mexico's export markets. This yields:

(10) $\log(XD_{noil}/XD_{noil}(-1)) =$

$$1.55 \underset{(0.96)}{- 0.95*\log(RPXPF/RPXPF(-1))} \underset{(2.79)}{}$$

$$\underset{(0.40)}{- 0.12*\log(RPXPF(-1)/RPXPF(-2))} + \underset{(3.38)}{1.50*\log(MF/MF(-1))}$$

R^2=0.59, DW=2.56, 1968-1987

where RPXPF=($P_{X,\$}/P_{MF}$), the dollar price of Mexican non-oil exports over the aggregate dollar-based price index of imports into Mexico's export markets. MF is the volume of imports into those markets (again, weighted by each country's share in Mexico's total non-oil exports). Analysis of the error structure suggested estimation in terms of rates of change rather than of (log) levels. The equation performs reasonably well: significant price elasticties and a high, significant "income" elasticity. However it would probably be useful to distinguish different export markets.

The model is completed by a commodity market clearing equation for current Mexican non-oil goods:

(11) $y_t = C_{pr,d} + I_{pr,d} + G_d + XD_{noil}$

In this set-up, the relative price of exports in terms of aggregate home goods, RPXPF=($P_{X,\$}/P_{MF}$), is considered exogenous. This is relaxed in the next section.

B.3 An Extension: Export Supply Considered Explicitly

In the analysis presented sofar, no explicit distinction was made between supply of home goods for domestic versus for foreign markets. Hence there is only one domestic output price. In practice however, it is more than likely that such an explicit supply does exist, either because of product differentiation or because of non-competitive market structure and different degrees of competition in home and foreign markets. A shorthand way of capturing this would be to endogenise the relative price of exports versus goods sold at home and estimate an explicit export supply function, according to which firms choose to sell at home or abroad depending on that relative price. Commodity market equilibrium would then involve two separate equations, one for goods sold at home and one for goods sold abroad.

(12) $\log(XS_{noil}/y_t) - \log(XS_{noil}(-1)/y_t(-1)) =$

$$\underset{(0.41)}{0.12} + \underset{(0.63)}{0.12}*\log(RPXY/RPXY(-1)) + \underset{(2.76)}{0.51}*\log(RPXY(-1)/RPXY(-2))$$

R_2 =0.31, DW=1.97, 1966-1987

with RPXY=$P_{X,\$}E/P_{GNP}$. The R^2 is low, as is to be expected for an equation estimated in rates of change; but supply elasticity with respect to price is significant and of the "right" sign. In this set-up, equation (11) is replaced by commodity market clearing for goods sold at home and for goods sold abroad:

(11a) $y_t - XS_{noil} = C_{pr,d} + I_{pr,d} + G_d$

(11b) $XS_{noil} = XD_{noil}$

The extra relative price variable is RPXY.

IV.2 The Framework Applied: Mexico's Outlook for Growth

A Private Savings, Investment and the Current Account: Is There Room for Growth?

The base case starts from an assumption of moderate (2 percent of GDP) current account deficits over the next two years. It constitutes less than half of the interest due and would, at projected world inflation rates, result in a fall in the real value of the debt. From 1992 onwards, we presume slight widening of the CA deficit to three percent of GDP. This is roughly compatible with a constant real value of the external debt and a falling debt-output ratio, as by that time growth will be gathering steam.

Given projected private savings and investment developments, what does this target imply for fiscal deficits? The model runs suggest that the non-interest budget surplus will need to average around seven percent for most of the period, down from 7.6 percent in 1986. This is below the consistency requirements derived in Section III in the first two years when real interest rates are likely to stay high. But it is above what is necessary towards the end of the sexennio when real rates, if all goes well, should drop to a more reasonable risk premium over foreign real rates. Real rates are assumed to stay at 30 percent in 1989, to fall to 20 percent in 1991 and 10 % from 92 onwards. The operational surplus will thus recover from its likely three percentage deficit in 1988 and a projected deterioration in 1989 to approximate balance by the end of the sexennio.

Private consumption is projected to slow down as a share of GDP somewhat next year, and recover the lost ground later in the sexennio. As to public investment, it is assumed to slightly fall in 1989 due to budgetary restraint, but gradually recover thereafter. This yields public investment of 5 percent of GDP in 1990, climbing to 6.5 percent at the end of the sexennio. What happens to total investment and thus output growth depends on private investment behavior. This in turn depends on real interest rates and the tax policy followed. Without any tax credit, investment is projected to slow down under the impact of continuing high real interest rates, down by almost two percentage points of GDP in 1990 compared to 1988. As a consequence, total investment would then fall by a percentage point of GDP in 1989, but gradually recovers thereafter to reach 18.5 percent of GDP towards the end of the sexennio (Fig. 5B). This is up from 15.4 percent in 1988.

This investment behavior will lead to a resumption of growth, but in a rather unspectacular manner (Fig. 5A). After a projected growth of 1.5 percent in 1989, output growth slowly climbs from 2 percent in 1990 to 3.7 in 1993 and 3.9 percent in 1994. Private investment, after dropping initially, will by then have recovered its 1988 value of around 12 percent of GDP under the influence of lower real interest rates. This implies that the main impetus will in fact come from government investment, which goes up by between two and three percent of GDP over the Sexenio.

An investment tax credit along the lines of the one that is in fact on the books since 1988 will have a significant impact. The analysis suggests that will especially be true in the early years where real interest rates are high (the scheme has been constructed so as to give bigger credits the higher the real interest rate is). Private investment, rather than dropping by a full percentage point in each of the first two years of the sexennio now hardly

falls at all in 1989 (down to 11.9% from 12.1 percent of GDP in 1988). After that a strong recovery follows as the tax credit reaches its full impact. Private investment reaches a peak of 14.1 percent of GDP in 1992 after which it tapers off slightly as the declining value of the tax credit more than offsets the impact of falling real interest rates. The end result is still a respectable 13.5 percent of GDP by 1994.

Since public investment is not affected by the tax credit, total investment will increase in line with private investment, to reach around twenty percent in the last three years of the Sexenio. As a consequence, real growth accelerates; it reaches four percent two years earlier because of the tax credit, in 1992 rather than in 1994. In the last two years of the Sexenio, the economy is projected to grow at a healthy 4.7 percent a year under this scenario.

Stronger investment performance under the same current account target of course requires higher private and/or public sector savings if the same current account performance is to be maintained. The econometric model runs suggest that under this high growth scenario, private consumption will grow faster, but less so than GDP. As a consequence, private savings goes up to provide between half and one percentage point of GDP extra leeway towards the end of the sexennio. The remaining difference will need to be made up by fiscal improvement. An initial improvement of between 1 and 1.5 percent of GDP in the non-interest surplus is necessary to accommodate the increased investment by the private sector. Reforms in tax administration and the structure of personal income and property taxation take on an added importance in this context. International personal income tax comparisons suggest that such an improvement in public sector revenue is not infeasible.

What about debt and the exchange rate under all these scenarios? Net external debt decreases under both scenarios as a percentage of GDP, but faster under the high growth scenario. Without the investment tax credit, net external debt falls from 67 percent of GDP in 1988 to 56 percent at the end of the Sexenio. Under the high growth scenario it actually goes down to 54 percent of GNP by 1994.

The model was run assuming a constant real exchange rate throughout both periods. This means that there is a potential imbalance between aggregate demand and supply for Mexican (non-oil) goods; the ratio of total demand for (non-oil) Mexican goods by foreigners (export demand) and by domestic residents over aggregate supply of Mexican goods can thus be interpreted as an indicator of exchange rate misalignment. A decline below one suggests exchange rate overvaluation (Fig. 6B). The model run suggests that exchange rates may in fact be a problem early in the Sexenio. The ratio is projected to drop from 89% in 1988 to 86% in 1989. After that the situation improves as increasing investment increases demand for domestic goods. Under the no-tax-credit scenario, the ratio improves rapidly after 1989 and actually reaches one by 1993. This suggests that growth in 1989 could actually be restricted because of low aggregate demand for Mexican goods at the current relative price (i.e. real exchange rate). A real devaluation would help avoiding this by shifting domestic and foreign expenditure towards Mexican goods; an issue is, however, whether under the Pacto a real devaluation can in fact be achieved.

A final comment on employment. The real wage was assumed to rise at 4 percent per annum, which, according to the econometric analysis, just offsets the autonomous increase in demand for labor for given GDP. However, with an estimated labor demand elasticity with respect to GDP of only 0.64, employment

growth is only 0.7 percent for the first two years, and then climbs up gradually to reach two percent at the end of the sexennio. It is not clear that with this growth and real wage outcomes, the projected increase in the labor force can be absorbed into productive employment.

B External Financing, Output Growth and the Public Sector

The scenario has sofar assumed that the foreign financing necessary to cover a current account deficit of between 2 and three percent of GDP will indeed be forthcoming. This will require additional financing, since Mexico has just entered a period of substantially increased repayment obligations. The implicit assumption is that these can be refinanced, and that additional funds will be available to allow a current account deficit of two percent of GDP initially and of three percent later on. Alternatively, the necessary room could be provided through debt relief, in which case the necessary decline in the non-interest current account can be reached without a deterioration in the current account, and correspondingly less need for new money. Of course, in the current external environment it is conceivable that aditional funds cannot be raised.

In this Section we consider two alternatives to the base run. Under the first one, Mexico will be allowed to run the same current account deficit as before, but with a major debt reduction operation early 1989 halfing the value of the outstanding commercially held debt. This implies a debt reduction of about 20% of 1988 GDP. The second alternative outlines what is likely to happen when no debt reduction takes place and no new money comes in other than rolled over principal. In this case Mexico has to run a zero current account deficit. We assume that the government attempts to maintain its stabilization effort; but in that case it is highly unlikely that domestic interest rates will come down. Under this zero CA run, therefore, domestic real interest rates stay at their current 30% level.

Consider first the case where no new money will be forthcoming, and no debt relief takes place. Mexico simply runs a zero current account balance, fully paying interest but rolling over principal. The macroeconomic consequences will clearly depend on how the internal adjustment to this external shock will take place. Does the fiscal sector adjust one for one? and if so, through cuts in government consumption or cuts in public sector investment? By assumption, the government cuts back public investment in line with the decline of "allowable" external net borrowing. On top of that comes reduced private investment because of higher real interest rates.

The external shock amounts to two percent of GDP initially, and three percent from 1993 onwards. Public investment falls to an absurdly low 0.9 percent of GDP in initially, and never regains the three percent level assumed for 1989 in the base case. It hovers around 2.7 percent of GDP for the rest of the sexennio.

This clearly has a major impact on growth (Fig. 6A, line "YGROCA0hr"). Output growth slows down by one percentage point initially; as time goes by the fall in growth deepens to more than two percent by the end of the sexennio as private and public investment decline. On average over the next six years, growth declines by almost 2 percent of GDP, to reach only two percent at the end of the sexennio and less than that before. The slowdown in growth has a perverse multiplier effect on the need for public sectore adjustment. Slower growth leads to a fall in private sector savings, which requires a larger

fiscal adjustment than would otherwise have been necessary. On the other hand reduced private investment (because of higher domestic real interest rates) creates more room for public sector deficits given the CA constraint.

Figures 6A-B here

Not surprizingly employment grows slows down too and never exceeds one percent in any year of the sexennio. Finally the exchange rate misalignment indicator drops too, and in fact never comes close to 1 (Fig. 6B) Under this scenario, exchange rate misalignment would be a continuing problem. The conclusion is that without access to external funds a real devaluation becomes unavoidable. This is of course the main channel through which uncertainty on the external debt situation influences domestic real interest rates.

The debt relief scenario paints a substantially rosier picture. Fig. 6A showes that with a 2% CA deficit increasing to 3% in 1992 AND a fifty percent reduction in commercially held debt, output growth is likely to come earlier and go further than in the base case. Also, the exchange rate misalignment problem, while still there in 1989, would disappear towards the second half of the Sexenio.

The message of this section is clear: unless debt relief or long term new money is provided on a scale allowing recovery of private investment, growth, both of output and employment, is not possible. Renewed output growth is incompatible with full service of the existing debt.

C External Shocks: Oil Prices and World Interest Rates

A simple rule of thumb already indicates Mexico's sensitivity to changes in world interest rates and oil prices. One dollar less per barrel of oil costs Mexico approximately $0.5 bUS, and one percentage point in the world interest rate adds $1 bUS to the burden of its external debt. Thus the recent rise in world interest rates (over two percentage points since March last year) costs Mexico roughly a percentage point of GDP, or half of the "low case" scenario explored in the last Section.

However, in particular interest rates have an impact that goes beyond their income effect. Interest arbitrage is almost certainly to lead to higher interest rates in Mexico if world interest rates rise. One would thus expect a further negative impact on output growth through a decline in private investment. Fig. 7 shows the net effects.

Fig. 7 Here

The recent rise in interest rates, once its impact on public and private investment is fully incorporated, leads to a fall in the growth rate of almost one percentage point towards the end of the Sexenio. This underscores the extent to which Mexico's problems are by now mostly foreign made. According to some estimates, a $150 bUS cut in US deficits (the Gramm-Rudman target) would lower real interest rates by three percentage points (van Wijnbergen (1985)). The US fiscal deficit can thus be blamed for a 1.5 percentage point drop in Mexico's growth rate in each year it is in effect.

V. Conclusions

Without renewed access to foreign capital markets, Mexico faces a grim fiscal situation. Without a net nominal increase in foreign debt, a 15 percent inflation target requires no less than a three percent increase in the non-interest surplus for fiscal consistency. This is up from the already extraordinarily high 7.6 percent primary surplus in 1988. To put this in perspective, this would amount to a wholesale scrapping of the entire public sector investment program. In fact, the fiscal effort should be even larger than that; at unchanged policies the operational deficit is likely to worsen in 1989 unless there is a substantial turn-around in the international price of oil. Measures to offset this increase would come in addition to the three percent.

An adjustment this large would clearly be a very difficult task after the massive fiscal retrenchment of the past few years. Issue of indexed domestic debt could alleviate the fiscal problem caused by high domestic real interest rates; but another conclusion seems inevitable. As long as internal internal rates remain as high as they are, Mexico's fiscal problems are intractable without renewed access to foreign capital markets. But the analysis suggests that rollover of half or two thirds of foreign interest payments, in addition to principal payments, would bring a solution within reach. But the paper also demonstrates that service of the face value of the current debt without substantial amounts of new money is incompatible with renewed output growth and thus not really in anybody's interest.

An important issue is the macroeconomic impact of the particular approach taken to debt relief. The paper demonstrated that public debt for private equity swaps would raise the equilibrium inflation rate substantially if implemented on a scale that is interesting from a macroeconomic point of view.

But without access to foreign capital markets in one form or another, output growth would be compromised, as the simulations have shown. Moreover, with low growth, the funding policies of the public sector will be complicated immensely. Also, with low growth and a high resource transfer to foreigners, the real exchange rate would need to be devalued much further than would be necessary with a smaller resource transfer out of Mexico. Low growth because of insufficient access to foreign capital markets would thus also jeopardise the short term stability sought under the Pacto. Renewed access to foreign capital markets is thus not only imperative for restoration of medium term growth, but also essential for the chances of success of the current short term stabilization effort.

The increase in external debt implied by renewed access to international capital markets does not really threaten Mexico's creditworthiness. Even a three percent of GDP (appr. 5 bUS$) current account deficit per annum, with a corresponding increase in external debt, would simply keep the external debt constant in real terms. Thus the debt-output ratio would in fact decline even at moderate rates of growth. On the other hand, a cut-off from external capital markets, with the attendant short term stabilization problems and likely medium term slow down in output growth, would compromise Mexico's ability to service even its current debt. Thus, paradoxically, lending to Mexico would very likely increase the expected net repayment, in discounted value terms, rather than decrease it, the increased up front borrowing initially notwithstanding.

All this depends crucially on developments in world commodity and capital markets. The income effects of a percentage point increase in the

world interest rate is roughly equal to the income effect of a $2 US decrease in the price of oil. Both cause Mexico to lose almost a billion US dollar a year. But higher world real interest rates are likely to cause at least equivalent increases in real interest rates at home, and possibly more if they lead to expectations of expected depreciation. They thus have a stronger impact on economic growth than oil price changes with equivalent income effects. As an example, the paper demonstrated that the effect of 2 percentage points increase in world interest rates between March 1988 and March 1989 slowed down Mexico's growth by an estimated one percentage point. The lesson seems to be that any external debt arrangement better includes contingency clauses conditional on oil price and foreign interest rate developments. Otherwise it might be difficult to maintain a stable growth performance in the middle of the vagaries of international developments.

With foreign financing in place, and the internal reform program continued and deepened beyond the considerable progress already made, a cautiously optimistic prognosis seems justified. The analysis presented suggests that with all this in place, a recovery of growth is likely to start by the end of 1989, with positive per capita growth to be expected thereafter. Moreover, while this would require additional funding from abroad, Mexico's debt indicators are projected to decline substantially nevertheless. With a continuation of the Government's reform program, investing in Mexico promises a high pay-off.

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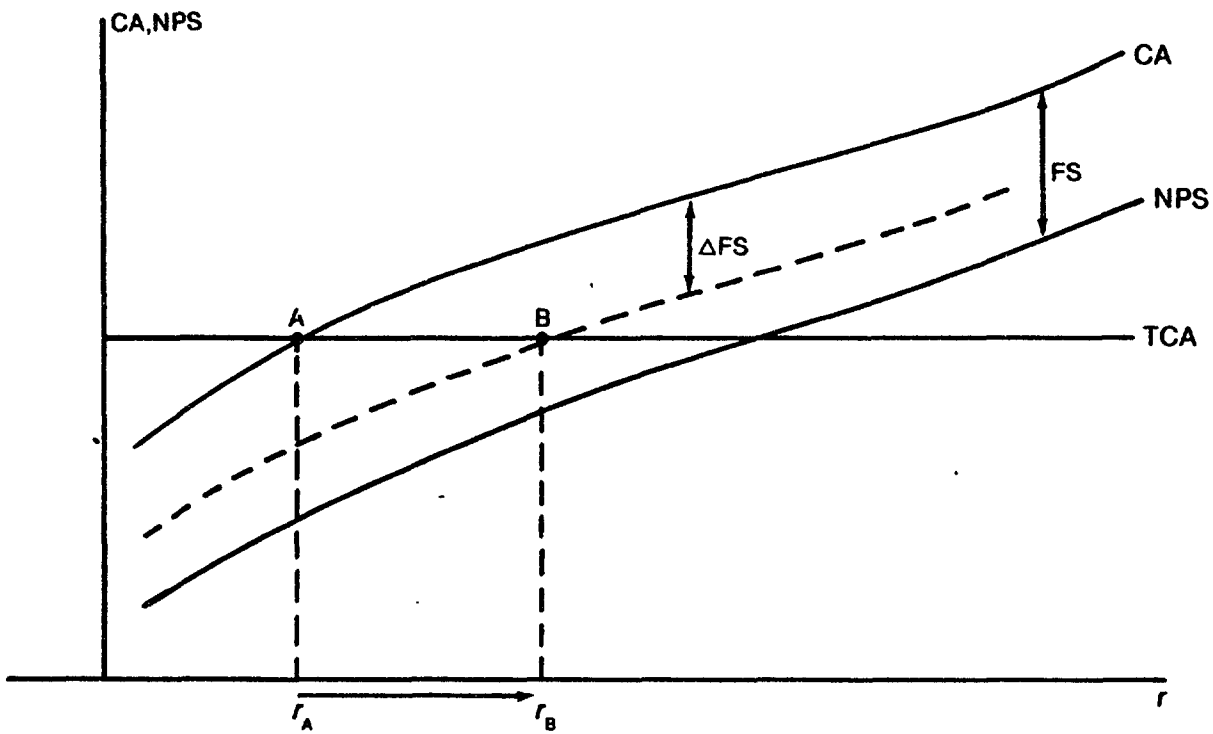

Figure 1

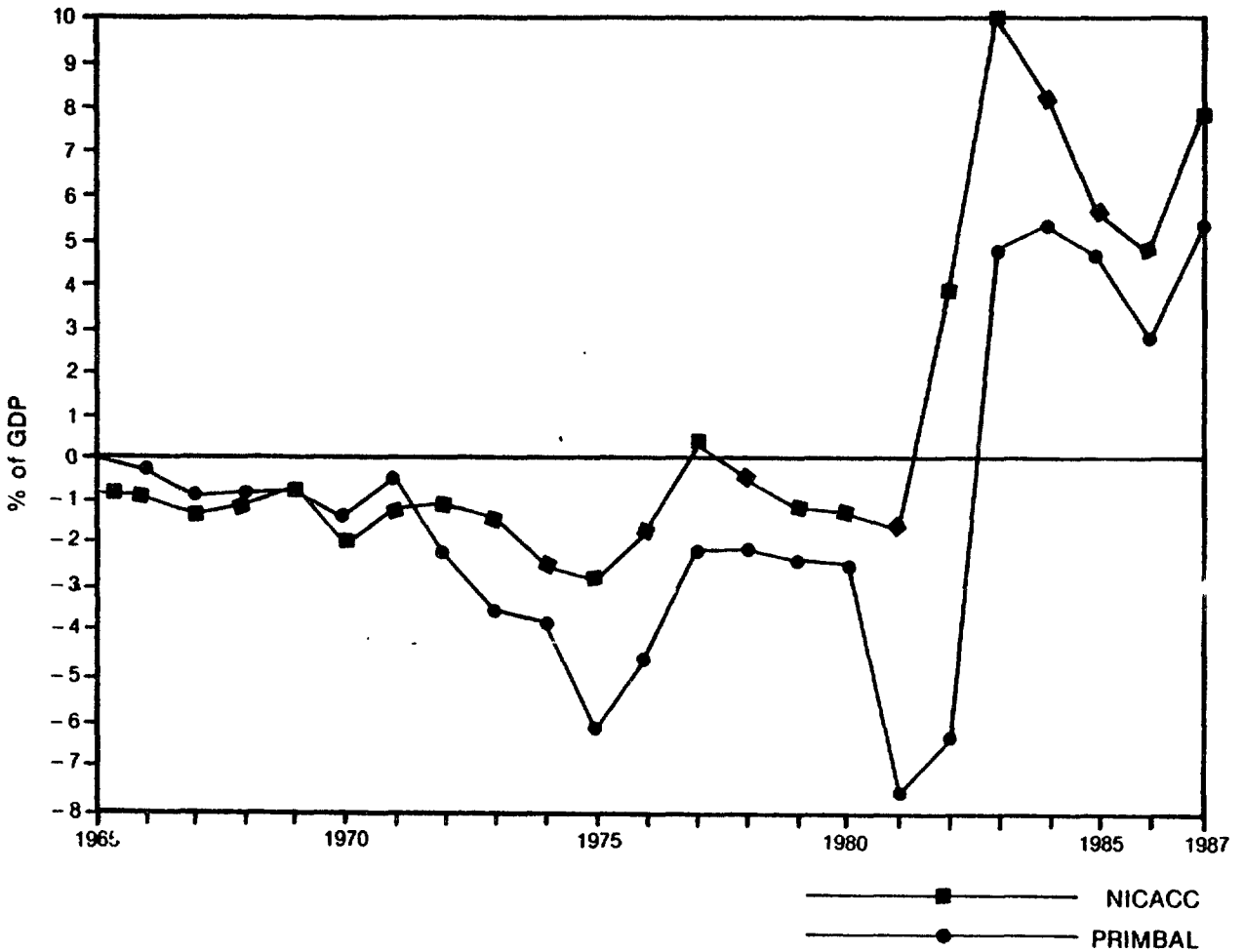
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
% of GDP
1965
1970
1975
1980
1985
1987
NICACC
PRIMBAL

Figure 2

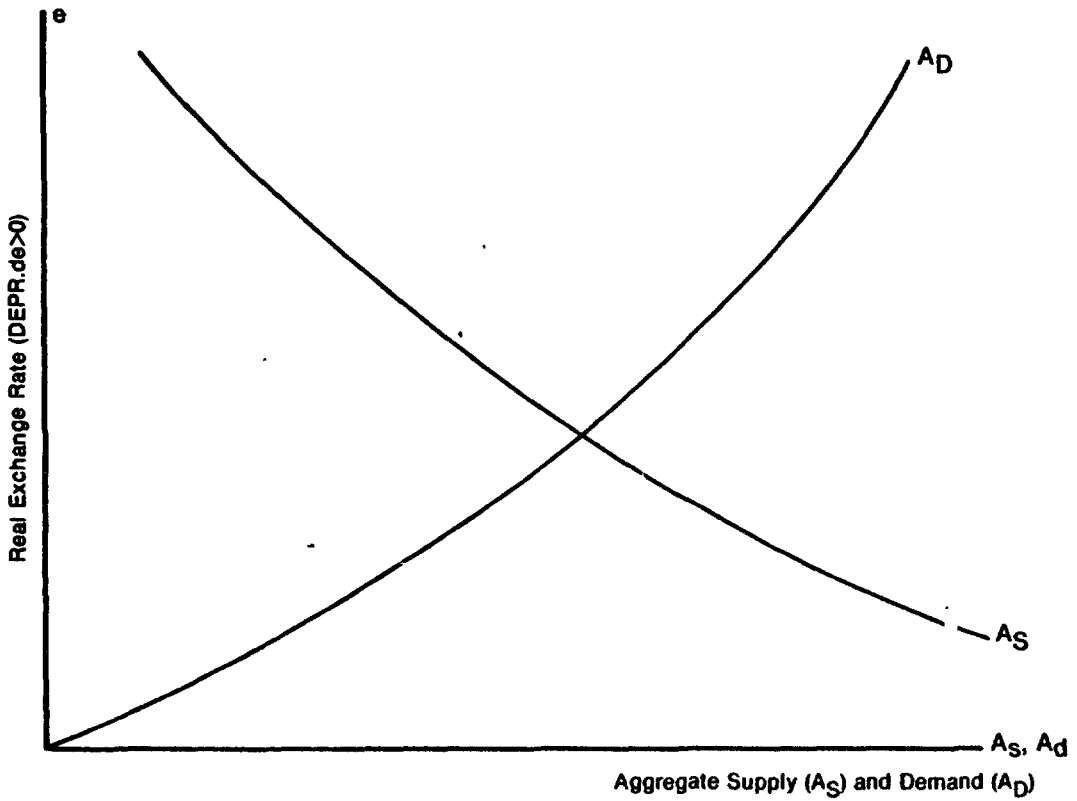
e
Real Exchange Rate (DEPR.de>0)
A_D
A_S
A_S, A_d
Aggregate Supply (A_S) and Demand (A_D)

Figure 3

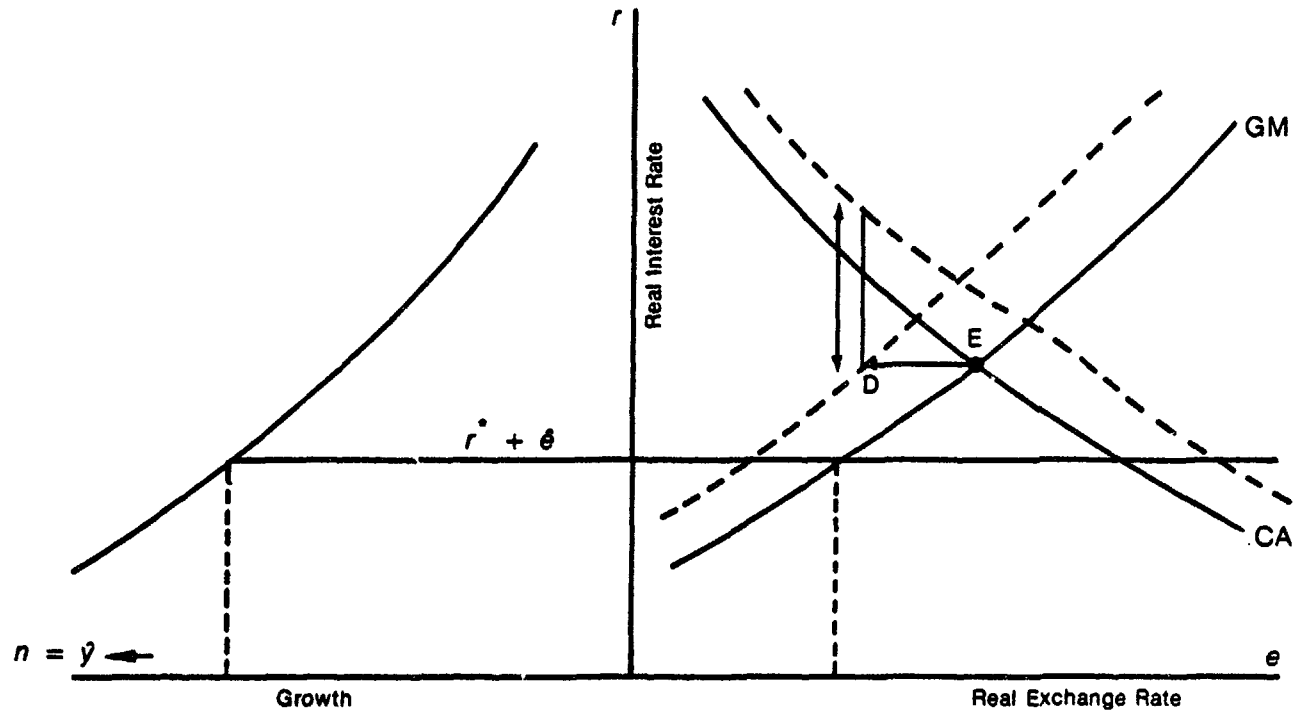

Figure 4.A

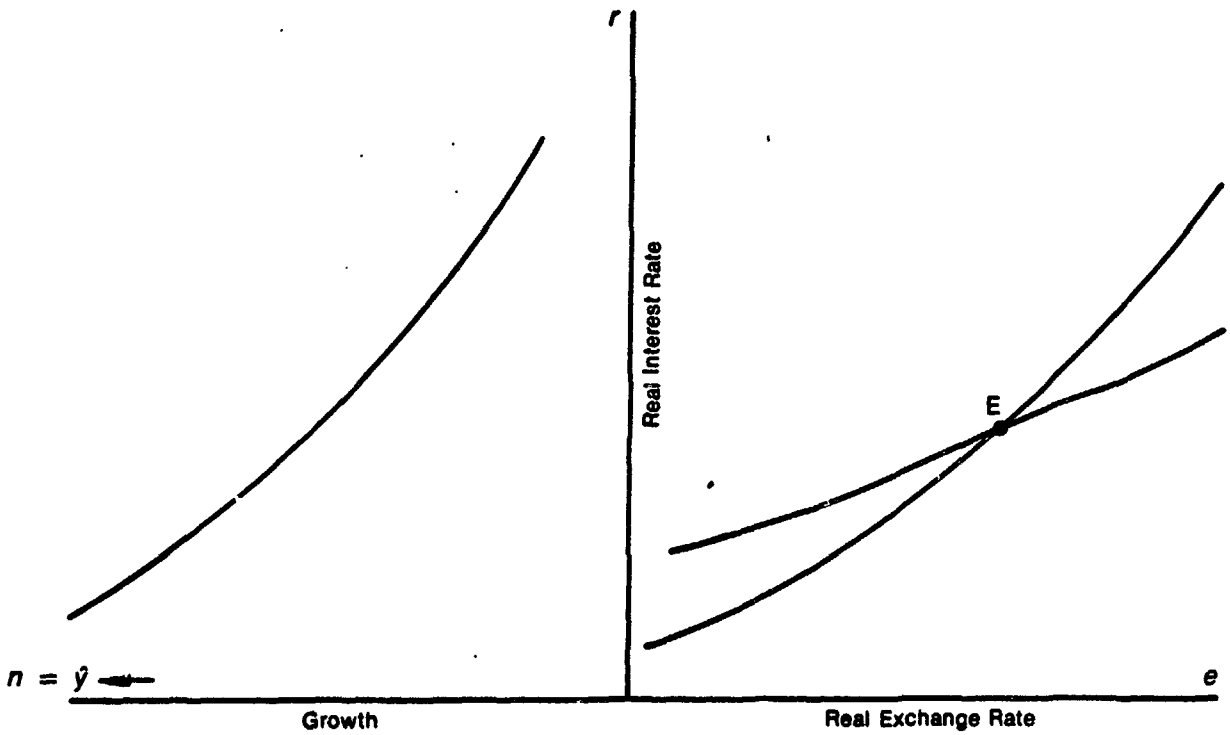

Figure 4.B

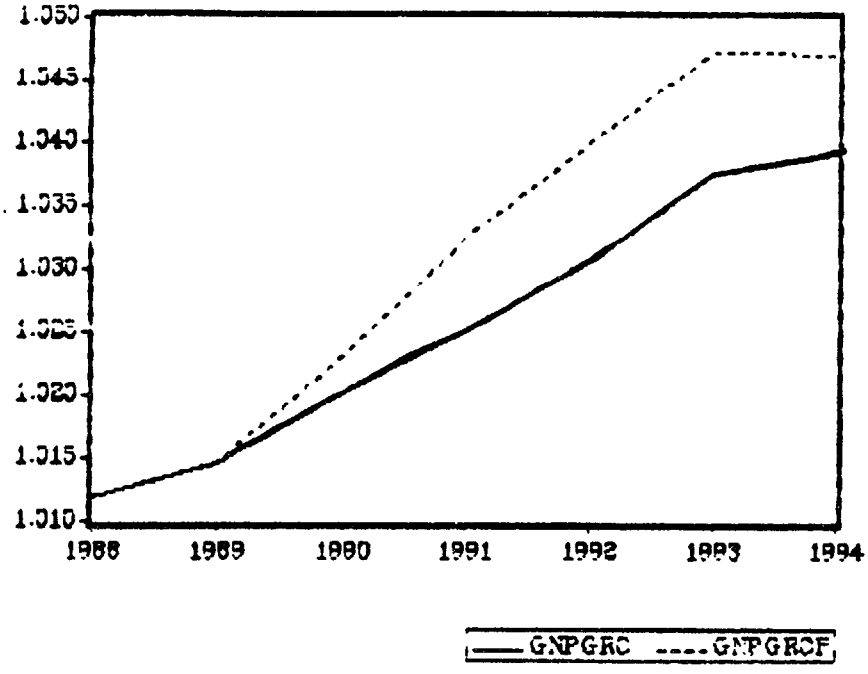

Figure 5A: Base case output growth with and without accelerated depreciation.

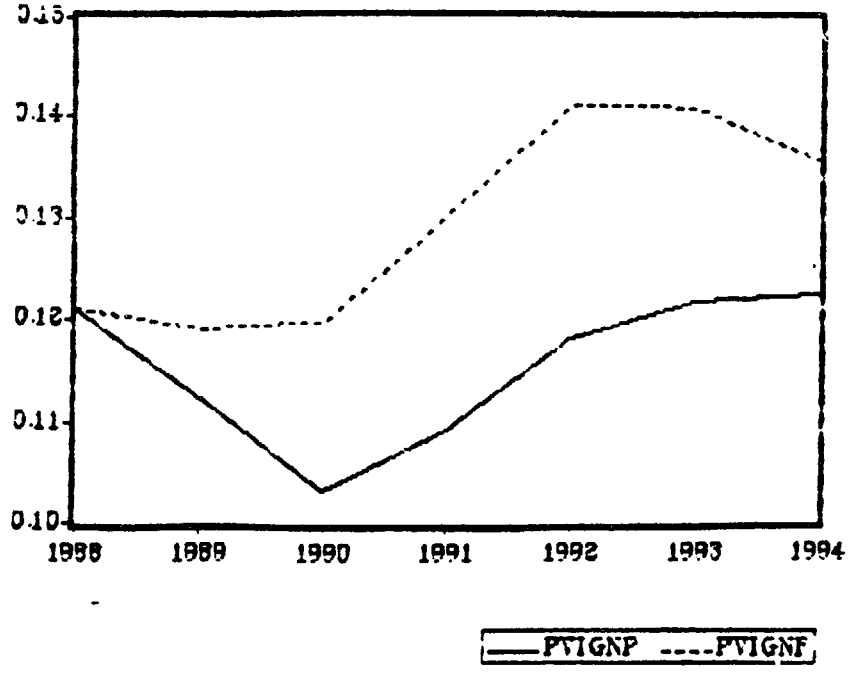

Figure 5B: Base case private investment with and without accelerated depreciation.

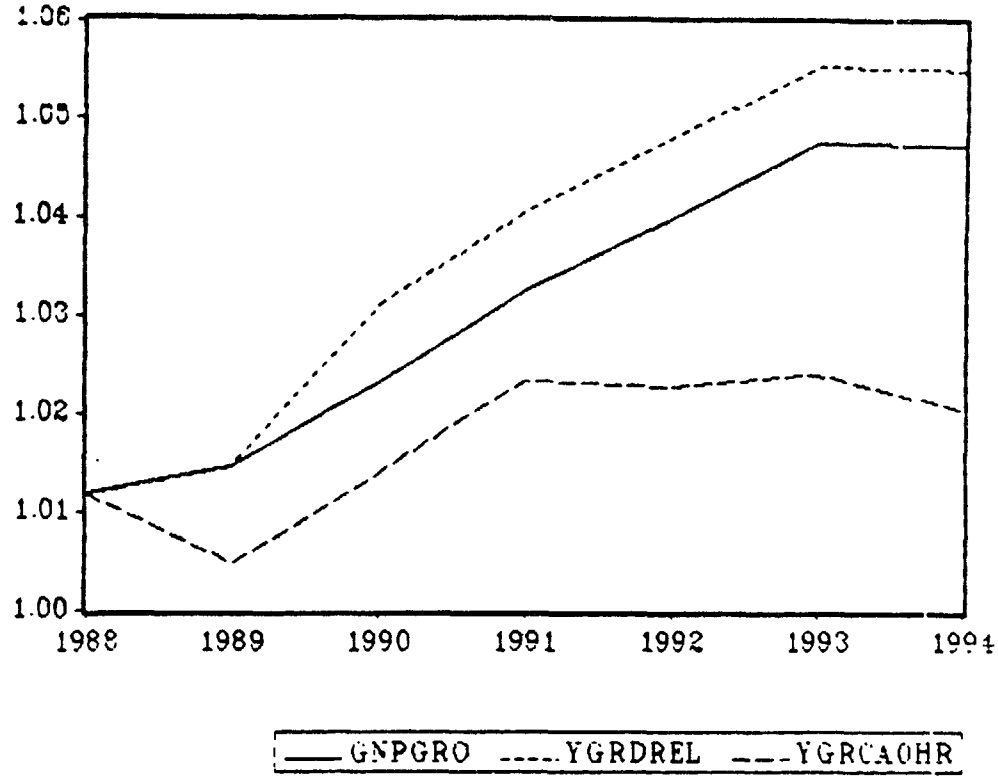

Figure 6A: Output growth in the base case with new money (GNPGRO), with more debt relief (YGRDREL) and without any debt solution (YGRCAOHR)

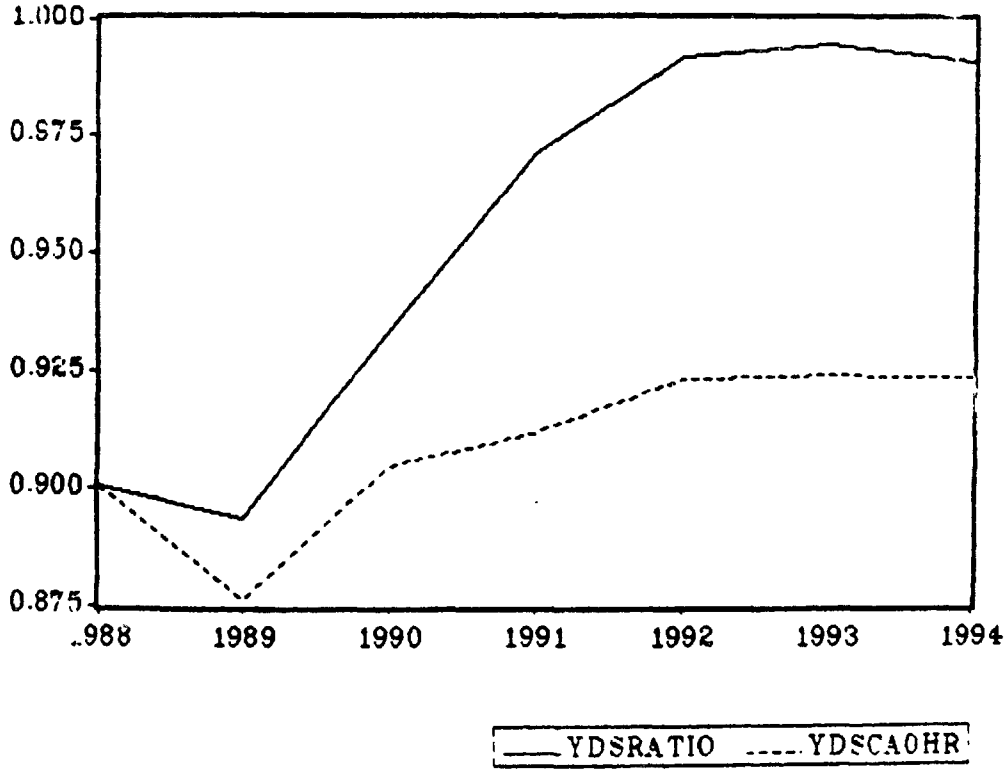

Figure 6B: Exchange rate misalignment in base case (YDSRATIO) and in no-debt-solution case (YDSCAOHR).

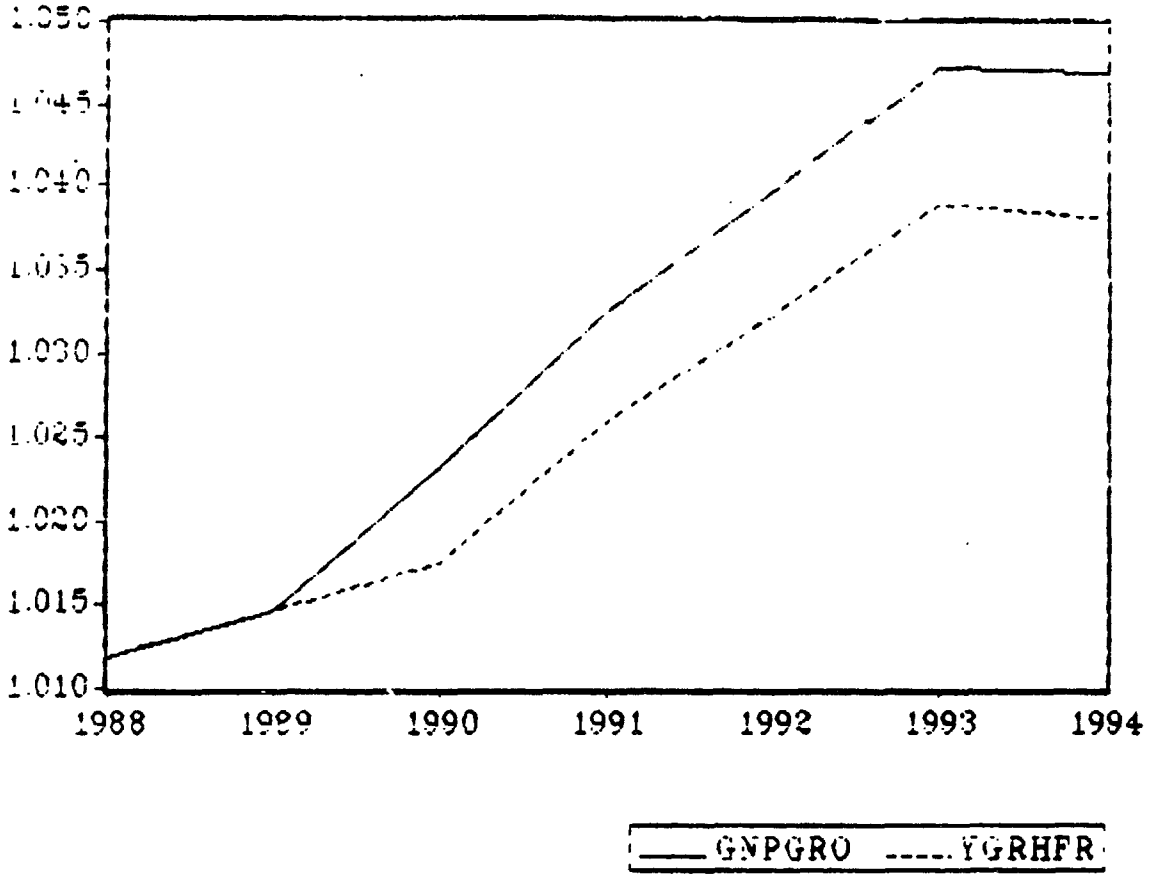

Figure 7: The impact of 2 percent points higher world interest rates on output growth.

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